DMSO VV&A Status Briefing

Navy Technical Working Group
June 12, 2002

Section I

DoDI 5000.61 - Status Report

DoD M&S/VV&A Policy

DoDD 5000.59

Focuses on DoD Modeling and Simulation Management. Originally released January 4, 1994. Administrative Reissuance January 20, 1998

DoDI 5000.61

Establishes common terminology and defines high level roles and responsibilities

The History

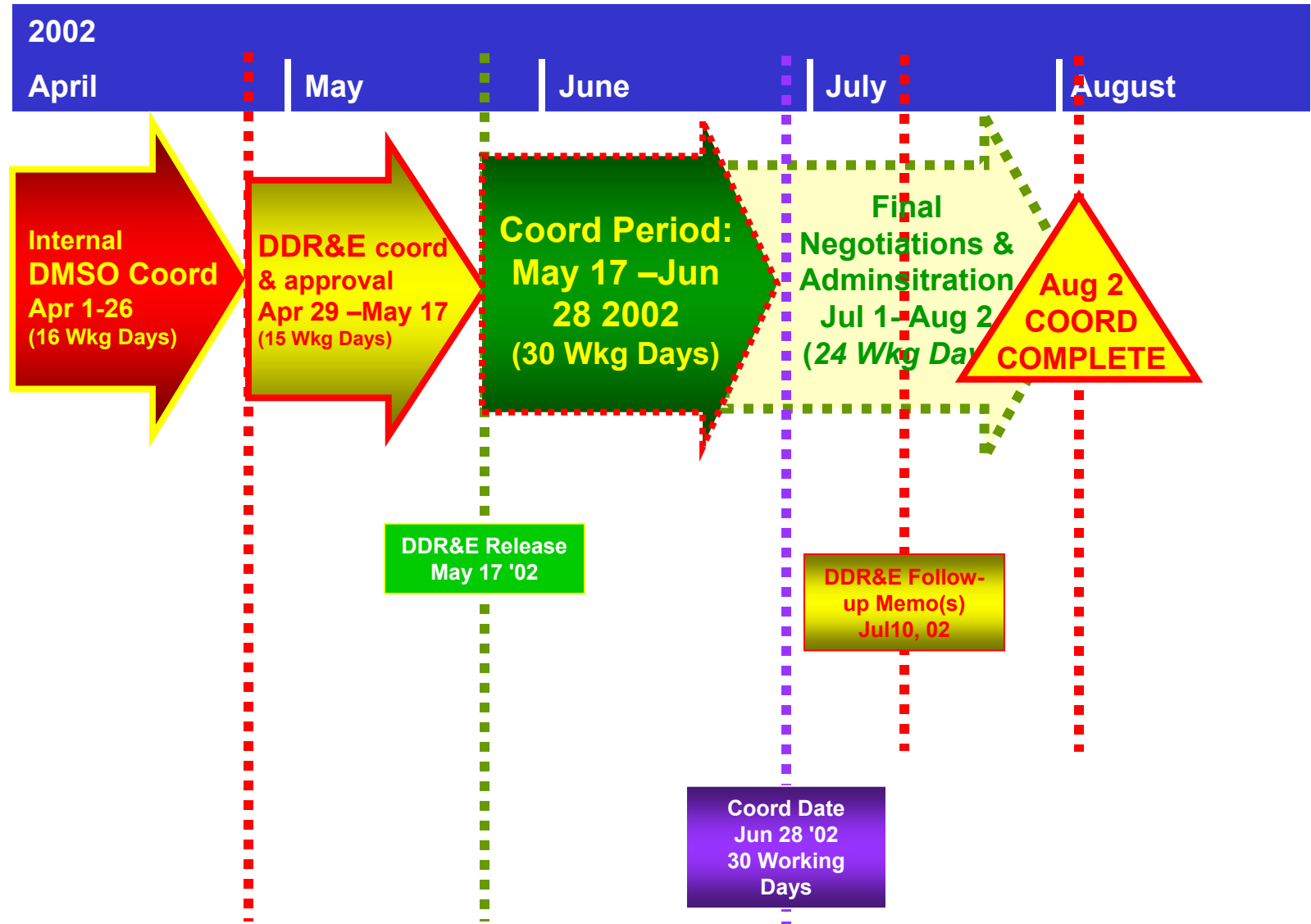| Event	Date
Form Tiger Team/Develop Draft	Fall 1998 – January 1999
Preliminary Brief to VV&A TWG	February 19, 1999
Tiger Team Meeting addressing TWG issues	April 1999
Briefing to TWG (DIA issue raised)	May 19, 1999
Briefing to MSWG	July 21, 1999

Coordination Chronology

Event	Date
DDR&E Signature (Dr. Etter for Dr. Mark) original coordination response	May 19, 2000 November 1, 2000
Change in Administration	January 20, 2001
Joint Staff/UCC Coordination	March 2001
1st Recoordination (USD(P), USD(P&R), GC)	July 30, 2001
2nd Recoordination (Army, Navy, Air Force)	August 8, 2001
DDR&E Signature (Dr. Sega)	December 6, 2001
3rd Recoordination (USD(P), Air Force, IG)	December 7, 2001

Re-Coordination Planning Timeline

2002				
April	May	June	July	August

Internal DMSO Coord Apr 1-26 (16 Wkg Days)

DDR&E coord & approval Apr 29 –May 17 (15 Wkg Days)

Coord Period: May 17 –Jun 28 2002 (30 Wkg Days)

Final Negotiations & Adminsitration Jul 1–Aug 2 (24 Wkg Days)

Aug 2 COORD COMPLETE

DDR&E Release May 17 '02

DDR&E Follow-up Memo(s) Jul10, 02

Coord Date Jun 28 '02 30 Working Days

VV&A RPG - Status Report

DoD VV&A Guidance

DoD Recommended Practices Guide (RPG)

Defines underlying philosophy, principles, and methodologies recommended for use in DoD VV&A efforts

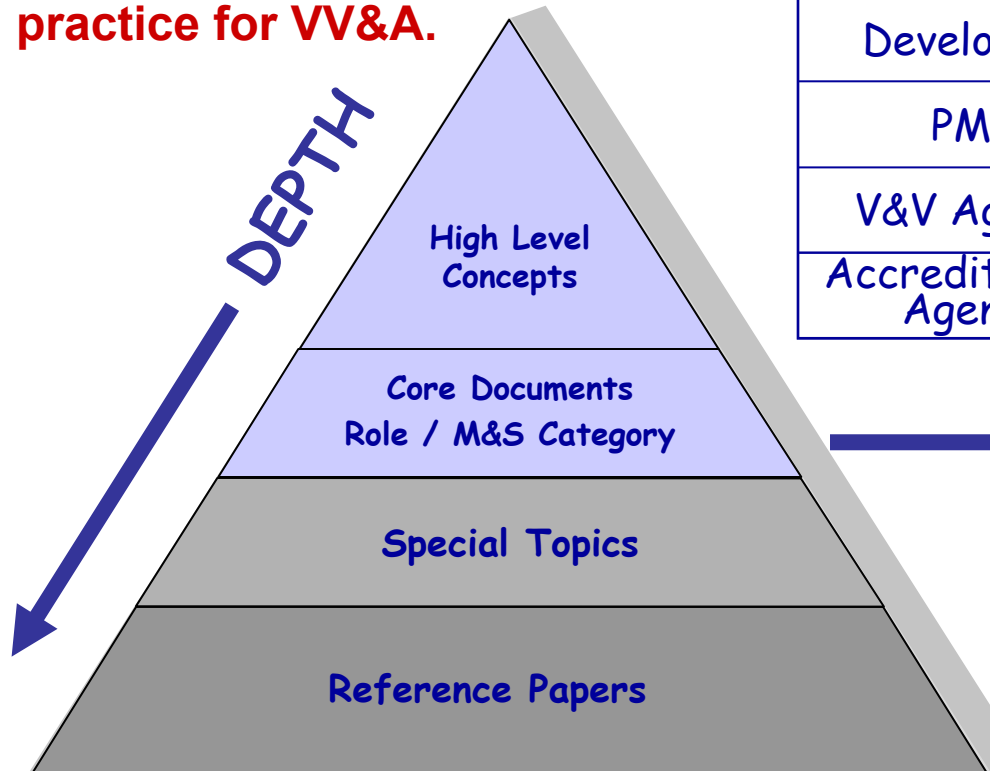1. Provides role specific guidance

2. Provides context specific guidance

http://www.msiac.dmso.mil/vva

DoD VV&A RPG

The Millennium Edition is a highly flexible, multi-tiered, multi-dimensional document which provides the state of the practice for VV&A.

Role Selection			
	Legacy	New	Federation
User	Select	Select	Select
Developer	Select	Select	Select
PM	Select	Select	Select
V&V Agent	Select	Select	Select
Accreditation Agent	Select	Select	Select

BREADTH

DEPTH

High Level Concepts

Core Documents
Role / M&S Category

Special Topics

Reference Papers

Build 2.5 – September 30, 2002

- **Complete Legacy Core Documents**

- **Additional Special Topics**
    - **Environment**
    - **Measures**
    - **Quality Assurance**

- **Report Templates**

- **DoD Security Compliance**

Work for Remainder of FY 02

- **Objective Referent**
  - establish study group in cooperation with JWARS program
  - proof of concept
  - demonstrate techniques
  - construct referent

- **VV&A Pedigree Template**
  - analyze existing M&S/VV&A templates & tools
  - develop standardized template
  - apply template to federation test cases (JDEP)
  - build community consensus for standardized template

- **Substantive Interoperability**
  - hands-on assessment of issues (JSB/JVB)
  - define & document key features
  - suggest existing techniques & emerging technologies

Strategy for FY 03

- **DoD/Service Level Meeting May 3, 2002 to discuss future plans and leveraging opportunities**
    - **automated templates**
    - **V&V cost studies**

- **Evolve experience-based data to build the federation core documents of the RPG**

Section III

DoD/Service Effort to Define Levels of V&V

The Players

Navy

Marine Corps

Air Force

Army

Navy Contractor

JHU/APL

DMSO

Problem Statement

Define scales for V&V factors that produce strong evidence allowing users to make informed decisions.

Purpose

Describe and develop standard rules of evidence to aid in making informed decisions regarding M&S credibility.

Paradigms Considered

- Advisory group for Aerospace Research Development Advisor Report CLIMB Levels & Data Sources and VV&A M&S Used for T&E – A Risk/Benefit Approach

- V&V Triangle

- IEEE Standard 1012-1998

- V&V Implementation at NASA, CrossTalk, May 2001, Consequences of Failure vs. Likelihood of Failure

- "An Aspect of Simulation Cost," PHALANX, 1 February 1996

- Planning for VV&A of M&S Applications, Winter Simulation Conference 2000, Weighted Indicator Hierarchy

- CMMI

Key Elements

- Things to consider when picking elements:
  - Requirements maturity
  - M&S structural integrity
  - M&S representational & performance integrity
  - Constraints & limitations (assumptions minimizing)
  - Data integrity
  - Satisfaction of user requirements/acceptability criteria
- Factors will include the following:
  - Process
  - Technique
  - Data
  - intensity
- Scales may be similar to *Consumer Reports* format. Need to minimize subjectivity in the V&V process and focus on objectivity.

Likelihood of Failures Based on Software Environment

Factors contributing to probability of software failure	Un-weighted probability of failure score					Weighting Factor	Likely-hood of failure rating
	1	2	4	8	16		
Software team complexity	Up to 5 people at one location	Up to 10 people at one location	Up to 20 people at one location or 10 people with external support	Up to 50 people at one location or 20 people with external support	More than 50 people at one location or 20 people with external support	X2	
Contractor Support	None	Contractor with minor tasks		Contractor with major tasks	Contractor with major tasks critical to project success	X2	
Organization Complexity*	One location	Two locations but same reporting chain	Multiple locations but same reporting chain	Multiple providers with prime sub relationship	Multiple providers with associate relationship	X1	
Schedule Pressure*	No deadline		Deadline is negotiable		Non-negotiable deadline	X2	
Process Maturity of Software Provider	Independent assessment of Capability Maturity Model (CMM) Level 4, 5	Independent assessment of CMM Level 3	Independent assessment of CMM Level 2	CMM Level 1 with record of repeated mission success	CMM Level 1 or equivalent	X2	
Degree of Innovation	Proven and accepted		Proven but new to the development organization		Cutting edge	X1	
Level of Integration	Simple - Stand alone				Extensive Integration Required	X2	
Requirement Maturity	Well defined objectives - No unknowns	Well defined objectives - Few unknowns		Preliminary objectives	Changing, ambiguous, or untestable objectives	X2	
Software Lines of Code*	Less than 50K		Over 500K		Over 1000K	X2	
Total							

Table 1 Likelihood of Failures Based on Software Environment

Application of a
Consumer Reports Format

Assessment of NGIT's Business Areas

	ADDRESSABLE			Margin Attractiveness	NGIT Capabilities	Total Assessment	NGIT CAGR % 2002-2008
	Market Size	Market Growth	Market Contracted Out				
C⁴ISR	Medium	Medium	Good	Good	Good	Good	7.4
Information Systems	Best	Best	Best	Best	Best	Best	9.5
Training & Simulation	Medium	Medium	Good	Good	Good	Medium	7.3
Science & Technology	Medium	Medium	Good	Good	Good	Medium	7.3
Base & Range Support	Best	Good	Good	Poor	Good	Good	8.6
Enterprise IT Solutions	Best	Good	Best	Worst	Best	Good	7.3

Best ● Good ◖ Medium ○ Poor ◑ Worst ○

Future Plans

- Two meetings thus far

- Next meeting will be in June 2002

- Planning invited speakers from SEI and other relevant communities